# Planet Formation in OB Associations

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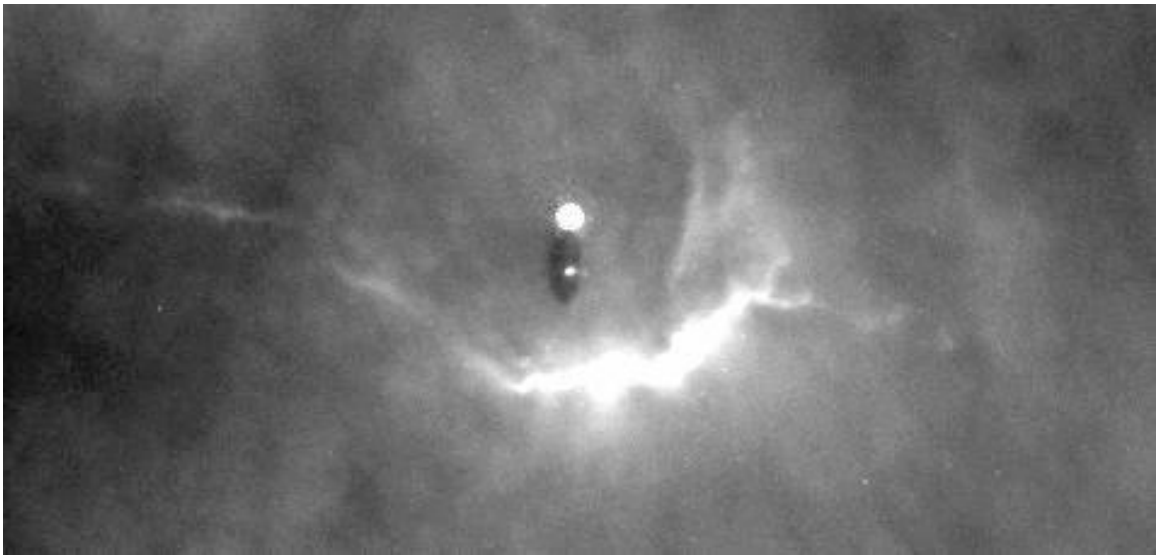
The majority (~90%) of stars form in dense clusters containing from tens to many thousands of stars. Most of these clusters are transient gravitationally unbound entities which expand and dissolve on a time-scale of several million years, comparable to the time required for planet formation. As planetary systems assemble, intense UV radiation, close-by passages of sibling stars, powerful stellar winds, and supernova explosions effect the protoplanetary disk. There is emerging evidence that our Solar system formed in just such an environment.

Contrary to previous ideas, recent work suggests that OB associations and UV-irradiated environments may be ideal sites for planetary system birth. The inner parts of disks can survive photo-erosion for many millions of years, longer than the survival time of gravitationally unbound clusters and their most massive stars. However, UV radiation and dynamical interactions with sibling stars can truncate the outer parts of disks.

The photo-erosion of light gases can increase the concentration of heavy elements, large dust grains, and ices to the point of gravitational instability. Thus, UV radiation may facilitate a critical step in planetary system evolution - the formation of planetesimals.

Dynamical perturbations by close-by passages of stars can induce strong shocks in a disk. Such interactions in a several million year old disk might explain the formation of chondrules found in primitive meteorites.

Supernovae in OB associations can supply the short-lived nuclei such as $^{60}$Fe and $^{26}$Al known to be injected into our Solar System within a few million years of its birth.



A young protoplanetary disk in a binary system in the Orion HII region M43. The disk and companion star are embedded in an externally ionized globule illuminated by the nearby massive star NU Ori. Note the bipolar jets emerging along the disk axis. (Hubble Space Telescope, Advanced Camera for Surveys, F658N filter.)